Database Management and Database Design
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Online Commerce Solution – Retail & Healthcare

Database Specification: Purpose, Business Problems Addressed, Business Rules, Design Requirements, Design Decision

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Database Purpose:

The goal of this project is to develop an e-commerce database design that enables online business platform with the facility to organize information related to orders, customers, payments, shipping, commodities and other relevant information in an efficient manner. Additionally, administrative team can generate a variety of useful reports that will help them enhance customer support and to handle logistics efficiently. This initiative also lays emphasis on healthcare services along with retail services.

Business Problems Addressed:

- This project provides business solutions to local vendors and consumers by providing an online commerce platform.
- Perform critical analysis about demand-supply statistics based on the data to effectively enhance and improve the platform for achieving a successful business model.
- It addresses the problem of minimizing human-human interactions while making substantial online services accessible to people during pandemic situations.
- It also focuses on providing feasible online healthcare services to customers.
- It enables users to book laboratory appointments and to purchase essential pharmaceutical drugs to be delivered directly to their respective households.

Business Rules :

- Customer needs to register or sign up before placing an order.
- Customer may have multiple address and card details.
- Customer can commodities or products to the cart.
- Customer can make a laboratory appointment for sample testing.
- Customer can order retail as well as pharmaceutical products.
- Customer has to upload the prescription document before placing a pharmaceutical order.
- Each commodity should be registered in commodity master entity with unique product id.
- Details of the commodity should be specified in commodity details entity.
- Stock quantity should be maintained in stock master entity along with seller id.
- While placing an order at least one product is mandatory.
- Invoice will be generated once order gets confirmed.
- Order will be place once payment is successful or defined.
- Each order may have multiple shipment details.

Design Requirements :

- Use Crow's Foot Notation
- Specify the primary key fields in each entity by indicating PK beside the field.
- Draw a line between the attributes of each entity to show the relationship between each entity. This line should be pointed directly to the attributes in each entity that are used to form the relationship.
- Specify which entity is on the one side of the relationship by placing a one next to the entity where the line starts.
- Specify which entity is on the many side of the relationship by placing a Crow's Feet Symbol next to the entity where the line ends.

Design Decisions :

S No.	Entity Name	Entity Purpose	Relation with other entities
1.	Customer_Base	The reason to include this entity is to get the personal details of the customer like name, gender etc. This entity will also include the information of the customer used by them to login or sign up. It also help us to find the type of customer. The database will also take care of the feedback provided by the customer.	This is the primary entity of the database. This entity will be related to customer_address and customer_card_details with one - to - many relationship. Here customer_id will act as the primary key which plays major role in relating to both customer_address and customer_card_details. It also relates to order_master entity with zero - to - many relationship.
2.	Customer_Address	For a better functioning of the idea the database will collect the address of the customer. This entity will also give specific details of the address like whether it is a home, office or other type of address. The database will also give a invoice to the customer for the account creation using the email id of the customer.	This entity is related to the Customer_base entity, which has primary key of address_id and customer_id. Customer_id will act as a foreign key helping to establish and identifying relationship with Customer_base.
3.	Customer_Card_Details	As the database itself describes that the entire process is online so likely the transaction will take place online using online payment method. This is where this entity is useful for our database. It includes the type of card by which the customer can make payment. The database will also consider the details of the card used except the CVV number.	This entity is related to the Customer_base entity, which has primary key of card_number and customer_id. Customer_ID will act as a foreign key to establish an identifying relationship with Customer_base.

4.	Commodity_Master	For a product that will be delivered, customer would like to know the details how a product can be delivered. This entity comes up with major details customer would like to know regarding the availability of Cash on Delivery, Branding of the product, Maximum limit of the quantity that can be delivered for a customer. This entity also shows up whether the product can be replaced or not.	As the name suggests the commodity_master will have the details of product with product_id as primary key. commodity_master will have a one- to -one entity relationship with commodity_details and one to many relationship with stock_master.
5.	Stock_Master	Knowing the availability of a product is one of the key factors in any Online Commerce platform. The stock_master entity provides the details of the seller name and total stock with the stock that is available for delivery.	Stock_master entity will have Seller_ID and product_id as primary key having one – to – one relationship with commodity_master and it will not be having any associative relationship with any other entities.
6.	Commodity_Details	The primary function of the project which is buying a product, is completely dependent on the specifications of the product which is described in commodity_details entity. The importance of showcasing the worth for price gives impact for the customer whether to decide the product should be bought or not. There is definitely a need for the customer to know the performance and quality assurance of the product which can be described by looking into multiple product level details which were covered in this entity.	As this entity gives all the specifications required for describing the product, There exists product_id as the primary key which will act as unique identification for the product connecting commodity_details to commodity_master through one – to – one relationship.
7.	Cart_Master	Usually a shopping cart provides an easiest way for the customer to accumulate the items they've chosen for purchase. This entity will act as the preview which shows the quantity, cart amount, status and date that the cart is created.	Each customer may add different products to cart. Cart_master entity will have one to one relationship with customer_base and commodity_master.
8.	Order_Master	One of the five main pillars of E-Commerce database Design is ORDER along with its entities, The purpose of this Entity is to understand the functionality of online based Purchase which is created and stored in this entity. It is important to maintain such	This entity is related to all other E-Commerce entities such as Customer, Commodity, Payment, Shipment. Essential customer details like name, delivery address, contact no, will be the base while purchasing a commodity online which brings us to commodity detail entity to get the details of the

		vital details to analyse the types of commodities purchased by customers based on which the demand-supply model can be effectively designed and helps in achieving a successful online business model.	product purchased. Order will be placed on successful payment method which involves payment entities while tracking the status of the order is mapped with shipment entities. This can be formulated using zero-many relationship between order_master and other entities.
9.	Order_Details	This entity is primarily used for handling and storing detailed data of a particular order like product information, price split up details, Invoice status, cancellation and return based Information along with supporting remarks.	The order_details entity is directly related to its parent table order_master which in turn has several relational dependencies with other entities. This makes this entity dependent with the specified Order_master related entities as well.
10.	Order_Shipment_Master	This entity essentially deals with delivery related information Such as delivery partner details, delivery date information and Address details of the customer. This data is crucial to for analysing and tracking delivery related issues and queries.	This is one of the associated table of order_master entity, It is related primarily with customer_address table along with the parent order_master table.
11.	Invoice_Master	The invoice master entity is intended to stay coordinated and vigilant about what total amount customers you owe.	The Invoice Master Entity is directly related to Order Master entity through one and only one relationship.
12.	Invoice_Details	The invoice detailed information helps to stay structured and informative about which goods and what taxes are levied by seller.	Invoice Details is linked directly to Invoice Master via one to one relationships.
13.	Payment_Master	The payment master is like a cash register responsible for handling and maintaining electronic payments. It helps to process, validate and authorize credit card and other forms of payments for ecommerce sites.	Information of Payment comes from Invoice_master through one to one relationship.
14.	Shipment_Details	The shipping detail entity was implemented to keep track of the distribution of orders, charges and the distribution partner's results.	The shipping details entity is linked to Order_shipment_master through one to one relationship.
15.	Prescription_Master	When it comes to healthcare or pharmaceutical related orders Prescription from certified doctors is a mandatory information which is stored and handled in our	This entity is entangled with customer_base and order_master entity as one of its attributes particularly for pharmaceutical based orders. This relation with

		database using this entity. This information helps customers to order the prescribed medications in precise quantities which becomes a critical Base for an online healthcare service.	order_master brings Upon its dependency with other cross-dependent Tables like customer, commodity, shipment and more.
16.	Appointment_Details	Detailed heath report back to customer via mail or courier. In this way, people with get benefited from not only remaining in their Respective households but also by minimising human-human interaction To avoid getting infected.	This entity is directly related to customer entity to get all basic information of the customer(patient in this case) like age, address. Also this entity uses several Attributes from associated order attributes like price information, status, hence forming Zero- to -many relationship with order_master.

Entity Relationship Diagram :